AMENDMENTS TO THE CLAIMS

1. (currently amended) A process for oxidizing nitric oxide comprising:

a) providing a stream of nitric oxide;

b) providing a ~~heated~~ surface heated to a temperature of 200-500°C within said stream of nitric oxide;

c) providing a hydrogen peroxide solution;

d) impinging said hydrogen peroxide solution onto said heated surface, whereby said hydrogen peroxide solution is decomposed into a plurality of oxidative free radicals; and

e) further oxidizing said nitric oxide to form nitrogen dioxide using said plurality of oxidative free radicals.

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2. (original) The process of claim 1, wherein said hydrogen peroxide solution contains 50 wt.% or less hydrogen peroxide.

3. (presently amended) The process of claim ~~1~~2, wherein said heated surface is heated to a temperature of 200-500°C.

4. (original) The process of claim 1, wherein said heated surface contains a catalytic coating.

5. (previously amended) The process of claim 4, wherein said catalytic coating contains an element selected from the group consisting of iron, chromium, copper, platinum, silver and palladium.

6. (previously amended) The process of claim 4, wherein said catalytic coating contains an oxide selected from the group consisting of silver oxide, iron oxide, ruthenium oxide, glass, quartz, Mo glass, Fe_3-xMn_xO_4 spinels, Fe_2O_3 with Cu ferrite, MgO and Al_2O_3.

7. (original) The process of claim 1, wherein said stream of nitric oxide contains 50-350 ppm nitric oxide.

8. (previously amended) The process of claim 1, wherein said plurality of oxidative free radicals is selected from the group consisting of hydroxyl radicals and hydroperoxyl radicals.

9. (original) The process of claim 1, further comprising the step of heating said hydrogen peroxide solution before impinging said hydrogen peroxide solution onto said heated surface.

10. (original) The process of claim 9, wherein said hydrogen peroxide solution is heated to a temperature of 140°C before impinging said hydrogen peroxide solution onto said heated surface.

11-20. (previously withdrawn)

21. (new) A process for oxidizing nitric oxide comprising:

a) providing a stream of nitric oxide;

b) providing a heated surface within said stream of nitric oxide;

c) providing said heated surface with a catalytic coating containing an element selected from the group consisting of iron, chromium, copper, platinum, silver and palladium;

d) providing a hydrogen peroxide solution;

e) impinging said hydrogen peroxide solution onto said heated surface, whereby said hydrogen peroxide solution is decomposed into a plurality of oxidative free radicals; and

f) further oxidizing said nitric oxide to form nitrogen dioxide using said plurality of oxidative free radicals.

22. (new) The process of claim 21, further comprising the step of heating said hydrogen peroxide solution before impinging said hydrogen peroxide solution onto said heated surface.

23. (new) The process of claim 22, wherein said hydrogen peroxide solution is heated to a temperature of 140°C before impinging said hydrogen peroxide solution onto said heated surface.

24. (new) A process for oxidizing nitric oxide comprising:

a) providing a stream of nitric oxide;

b) providing a heated surface within said stream of nitric oxide;

c) providing a hydrogen peroxide solution;

d) heating said hydrogen peroxide solution to a temperature of 140°C;

e) impinging said 140°C hydrogen peroxide solution onto said heated surface, whereby said hydrogen peroxide solution is decomposed into a plurality of oxidative free radicals; and

f) further oxidizing said nitric oxide to form nitrogen dioxide using said plurality of oxidative free radicals.

25. (new) The process of claim 24, wherein said heated surface contains a catalytic coating.

26. (new) The process of claim 25, wherein said catalytic coating contains an element selected from the group consisting of iron, chromium, copper, platinum, silver and palladium.

AMENDMENTS TO THE CLAIMS

1. (currently amended) A process for oxidizing nitric oxide comprising:

a) providing a stream of nitric oxide;

b) providing a ~~heated~~ surface heated to a temperature of 200-500°C within said stream of nitric oxide;

c) providing a hydrogen peroxide solution;

d) impinging said hydrogen peroxide solution onto said heated surface, whereby said hydrogen peroxide solution is decomposed into a plurality of oxidative free radicals; and

e) further oxidizing said nitric oxide to form nitrogen dioxide using said plurality of oxidative free radicals.

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2. (original) The process of claim 1, wherein said hydrogen peroxide solution contains 50 wt.% or less hydrogen peroxide.

3. (cancelled)

4. (cancelled).

5. (cancelled)

6. (presently amended) The process of claim 41, wherein said catalytic coating contains an oxide selected from the group consisting of silver oxide, iron oxide, ruthenium oxide, glass, quartz, Mo glass, Fe_3-xMn_xO_4 spinels, Fe_2O_3 with Cu ferrite, MgO and Al_2O_3.

7. (original) The process of claim 1, wherein said stream of nitric oxide contains 50-350 ppm nitric oxide.

8. (previously amended) The process of claim 1, wherein said plurality of oxidative free radicals is selected from the group consisting of hydroxyl radicals and hydroperoxyl radicals.

9. (original) The process of claim 1, further comprising the step of heating said hydrogen peroxide solution before impinging said hydrogen peroxide solution onto said heated surface.

10. (original) The process of claim 9, wherein said hydrogen peroxide solution is heated to a temperature of 140°C before impinging said hydrogen peroxide solution onto said heated surface.

11-20. (previously withdrawn)

21. (new) A process for oxidizing nitric oxide comprising:

a) providing a stream of nitric oxide;

b) providing a heated surface within said stream of nitric oxide;

c) providing said heated surface with a catalytic coating containing an element selected from the group consisting of iron, chromium, copper, platinum, silver and palladium;

d) providing a hydrogen peroxide solution;

e) impinging said hydrogen peroxide solution onto said heated surface, whereby said hydrogen peroxide solution is decomposed into a plurality of oxidative free radicals; and

f) further oxidizing said nitric oxide to form nitrogen dioxide using said plurality of oxidative free radicals.

22. (new) A process for oxidizing nitric oxide comprising:

a) providing a stream of nitric oxide;

b) providing a heated surface within said stream of nitric oxide;

c) providing a hydrogen peroxide solution;

d) heating said hydrogen peroxide solution to a temperature of 140°C;

e) impinging said 140°C hydrogen peroxide solution onto said heated surface, whereby said hydrogen peroxide solution is decomposed into a plurality of oxidative free radicals; and

f) further oxidizing said nitric oxide to form nitrogen dioxide using said plurality of oxidative free radicals.

23. (new) A process for oxidizing nitric oxide comprising:

a) providing a stream of nitric oxide;

b) providing a surface heated to a temperature of 200-500°C within said stream of nitric oxide;

c) providing said heated surface with a catalytic coating containing an element selected from the group consisting of iron, chromium, copper, platinum, silver and palladium;

d) providing a hydrogen peroxide solution;

e) impinging said hydrogen peroxide solution onto said heated surface, whereby said hydrogen peroxide solution is decomposed into a plurality of oxidative free radicals; and

f) further oxidizing said nitric oxide to form nitrogen dioxide using said plurality of oxidative free radicals.

24. A process for oxidizing nitric oxide comprising:

a) providing a stream of nitric oxide;

b) providing a heated surface within said stream of nitric oxide;

c) providing said heated surface with a catalytic coating containing an element selected from the group consisting of iron, chromium, copper, platinum, silver and palladium;

d) providing a hydrogen peroxide solution heated to a temperature of 140°C;

e) impinging said heated hydrogen peroxide solution onto said heated surface, whereby said hydrogen peroxide solution is decomposed into a plurality of oxidative free radicals; and

f) further oxidizing said nitric oxide to form nitrogen dioxide using said plurality of oxidative free radicals.

S.N. 10/014140

CLAIMS

What is claimed is:

1. A process for oxidizing nitric oxide comprising:

a) providing a stream of nitric oxide;

b) providing a heated surface within said stream of nitric oxide;

c) providing a hydrogen peroxide solution; and

d) impinging said hydrogen peroxide solution onto said heated surface, whereby said hydrogen peroxide solution is decomposed into a plurality of oxidative free radicals which further oxidize said nitric oxide to form nitrogen dioxide.

2. The process of claim 1, wherein said hydrogen peroxide solution contains 50 wt.% or less hydrogen peroxide.

3. The process of claim 1, wherein said heated surface is heated to a temperature of 200-500°C.

4. The process of claim 1, wherein said heated surface contains a catalytic coating.

5. The process of claim 4, wherein said catalytic coating contains an element selected from the group comprising iron, chromium, copper, platinum, silver and palladium.

6. The process of claim 4, wherein said catalytic coating contains an oxide selected from the group comprising silver oxide, iron oxide, ruthenium oxide, glass, quartz, Mo glass, $Fe_{3-x}Mn_xO_4$ spinels, Fe_2O_3 with Cu ferrite, MgO and Al_2O_3.

7. The process of claim 1, wherein said stream of nitric oxide contains 50-350 ppm nitric oxide.

8. The process of claim 1, wherein said plurality of oxidative free radicals is selected from the group comprising hydroxyl radicals and hydroperoxyl radicals.

9. The process of claim 1, further comprising the step of heating said hydrogen peroxide solution before impinging said hydrogen peroxide solution onto said heated surface.

10. The process of claim 9, wherein said hydrogen peroxide solution is heated to a temperature of 140°C before impinging said hydrogen peroxide solution onto said heated surface.

11. A system for oxidizing nitric oxide comprising,

a) a pipe containing a gas stream of nitric oxide;

b) a structure disposed in said nitric oxide gas stream, said structure including a surface;

c) a first heater for heating said surface of said structure; and

d) an injection nozzle disposed in said pipe and positioned to impinge a hydrogen peroxide solution onto said surface of said structure to decompose said solution into a plurality of oxidative free radicals which further oxidize said nitric oxide to form nitrogen dioxide.

12. The system of claim 11, further comprising a second heater for heating said nozzle so that hydrogen peroxide solution therein is heated prior to being impinged onto said heated surface.

13. The system of claim 11, wherein said first heater is selected to heat said surface to a temperature of 200-500°C.